Endicott Development Project

Public Scoping Meeting

Fairbanks

1983

TRANSCRIPT OF PROCEEDINGS

FEBRUARY 10, 1983

FAIRBANKS, ALASKA

ENDICOTT DEVELOPMENT PROJECT

H & M COURT REPORTING
1031 WEST 4TH AVENUE, SUITE 220
ANCHORAGE, ALASKA 99501
(907) 274-5661

P R O C E E D I N G S

COLONEL SALING:

Ladies and gentlemen, let me welcome you all to this fifth Scoping Meeting that the Corps is holding with regards to a permit that we received application for from Sohio Corporation for the development just off the North Slope. In fact, it's the Sagavanirktok Delta.

What we're doing in these series of meetings is collecting information from the public as to the concerns they have that they would like to see addressed in the Environmental Impact Statement that the Corps is required to prepare prior to making some sort of decision on the permit application.

As you came in you may have glanced in the back of the room. We have a couple charts up there that illustrate the location of this particular project that's been proposed; in addition to that there is some booklets that I hope you picked up, that address the subject in somewhat more detail of what we're going to talk about.

I have with me today the consultant that is working with the Corps in the preparation of the Environmental Impact Statement, Bob McDonald, who is going to talk to you a little bit later about some of

the aspects of the preparation of the Environmental Impact Statement, and then Del Dias and Dan Huxley, our engineers who are working on this particular project for Sohio, and they're going to give you a technical explanation about what the project consists of.

Very briefly, the project consists of the construction of four gravel islands. Three for the purpose of production of oil from the Endicott Reservoir, hence the name and Endicott Development. Some of you who may have worked on this before, or may have known that it's the Sag Delta and the Duck Island involvement, but this particular project now is being known as the Endicott Development.

That will give you an in-depth briefing on what, exactly, the field consists of, and what the construction that they propose consists of.

Now, the way we're going to run this today, after I get through making my introductory remarks, I'm going to turn it over to Bob. He's going to talk about the Environmental Impact Statement and that process, and then we will go through to the technical presentation.

In the past what we've done is then have questions on the technical portions of the project,

as is proposed; take a break; and then those people who wish to make a statement or have some comments that they would like to make as to those things that they think should be addressed in the Environmental Impact Statement, then you could come up here and provide those comments to us.

If it turns out we won't have very many people that would like to make those kind of comments, we'll just run right on in through the question.

I would ask, if you have questions, please stand up and speak loud enough; we're going to try to pick up the questions, as well as the answers on these microphones, so we have a permanent record of what's going on.

We have conducted four other meetings prior to this. The first one was held in Anchorage, the second one was held in Barrow, and the third and fourth were held in the villages of Nuiqsut and Kaktovik, up on the North Slope, and I must say, it's much easier to do this today than those two, because I had to work through an interpretor in each of those, and that takes some time, when you speak three sentences and then wait for it to be translated in the Native language; I felt I was back in Europe again.

But we had some good input from the people who were directly involved there on the North Slope, and I hope that we get the same kind of enthusiastic response today.

So with that I would like to pass on to Bob, and he will talk to you a little bit about the process. And I want to emphasize again that there has been no decision made insofar as this permit is concerned, and that decision will be a Corps decision following the preparation of the impact statement.

There are three alternatives: One is to deny the permit; one, is to accept it as it has been presented to us by the oil companies; and the third is to accept it with modifications that are identified as part of the Environment Impact Statement process.

There will be a draft prepared of the impact statement; you will have a chance to comment again before the final statement is prepared.

So with that, Bob, let me turn it over to you.

MR. McDONALD:

Thank you, Colonel.

As the Colonel indicated, I'm the overall project manager from Environmental Research and Technology, and we are the third party EIS contractor. We will be preparing the Environmental Impact Statement

working with the Corps of Engineers on this particular project.

We've been working quite closely with the Corps of Engineers throughout the last two months in preparation of the Scoping Sessions, and in the process of developing the detail study plans.

What we'd like to do today is to -- as the Colonel indicated, solicit your input on the issues and concerns that you might have on this project. And in order to facilitate that, I divide this particular section of the presentation into three different parts.

The first part will be a presentation by Sohio on the project engineering and permits. Following that I will have a brief overview of the Environmental Statement process, and lastly, I'll give a summary of the EIS Scoping Process.

The Colonel indicated that Dan Huxley from Sohio will be giving a presentation on engineering, and Del Dias, from Sohio, who is also available to answer any questions you might have on the environmental studies that have been conducted to date.

With that as a brief overview of what we're going to accomplish through the next half an hour or so, I'll turn the presentation over to Dan, who will now

give you an overview of the project description, ar the alternatives.

MR. HUXLEY:

I would like to start by just giving a brief review of what progress has been made on the project during the last nine months.

Back in May of last year we had a general development review meeting with a number of the agencies in Anchorage, and I know some of you might have been present at that meeting.

Since that time a number of things have happened to the project, and I would just like to go over those briefly.

Firstly, we have completed the major conceptua. engineering design studies for the project. These studies have been conducted for the purpose of determining the technical feasibility of developing the field, and the estimated cost of that development.

The studies had been scoped out on a very broad basis, realizing that the work would be optimized in the later design phases.

The next item that has happened of significance, has been the filing of the initial project permit. This occurred in September of last year, and as the

Colonel mentioned, this is the permit that has kicked off the Environmental Impact Statement process for which you're here this afternoon.

The reason for filing this application early is twofold. Firstly, we realize that the EIS process is a lengthy one. And the time we receive the permits for the project is rather critical to our overall project development schedule. And secondly, it's been our intent, and continues to be our intent, to resolve issues of agency and public concerns early on in the project as we possibly can.

The other significant item that's occurred has been the preparation and submittal to the Corps and the other permitting agencies, an environmental overview and engineering overview on the project. The engineering overview describes the base case under the concept that was carried through conceptual engineering.

The environmental overview describes the environmental setting and discusses the changes that might occur as a result of the proposed development.

At this time right now I would just like to go over some of the current work efforts. Presently the companies are evaluating the major development concept alternatives that are available to us, with

the intent of arriving at a preferred development scheme.

The focus in this effort right now is on the selection of a preference for just how many islands -- the number islands, and location of those islands, are going to be required to develop the project.

The other item that's ongoing right now, or getting ready for, is the start of our preliminary design activity. This is something that we expect to get underway in the second quarter of this year.

And the third item ongoing that we've just begun, has been conducting a 3-D seismic program, which we're doing this winter out in the project area. This is a very extensive survey conducted, really, for our purposes, to get a better understanding of the reservoir that we're trying to develop.

In the general nature, I think it's important to note that the companies have not made a final commitment at this time to develop the project, and cannot make that commitment until such time as additional reservoir, engineering and environmental information is gained on the project.

This project is marginal economically, and even though we recognize that a significant oil and gas accumulation does exist in this development area, the

cost of this development is very, very high.

At the present time we are estimating the development cost to be somewhere in the neighborhood of 2.5 to $3 billion in today's money; this includes the cost of both facilities and the wells necessary to develop the field.

I mention this to clear up some confusion that we've seen and we've noted in the press, indicating that the project may only cost in the neighborhood of $1 billion; we feel that figure is vastly understated, and this is truly our understanding of the sort of money that's involved in developing this field.

What I would like to do now is move on to a description of the project itself, as we're carrying it.

As the Colonel mentioned, the base case, number one, and you heard general remarks on this -- the base case that we're going to be describing, or I'll be discussing here this afternoon, is the case that we carried through our conceptual design, the case that is discussed in detail in the engineering overview, and is summarized in the handouts that are in the back of the room there.

It includes both the facilities that we expect to

be in operation at start-up, as well as any increments that will become in place after production start-up.

The project is located about 15 miles east of Prudhoe Bay, and somewhere between two and four miles offshore. The water depths in the project location are between four feet and 18 feet of water.

In the very general nature, we're talking about four gravel islands, a main drilling and production island, two satellite drilling islands, and a separate waterflood island.

The number of wells that we're expecting is a total of about 240; that will include 80 on each of the three drilling and production islands.

We will have subsea pipelines connecting four islands. In addition to that, we'll have a gravel causeway connecting the main island to shore.

On this causeway we will be carrying the crude and gas product pipelines through the delta area over to sales points at Prudhoe Bay. In addition to that, we'll have a main construction camp and a base operations camp located in the Delta Uplands.

The project is expected to start-up in mid 1988. The start-up production at that time, and the peak production for the project is expected to be

somewhere between 75 and 150,000 barrels of oil per day.

The production will peak at that rate to continue for a few years and then drop off and decline.

The gas sales is expected to peak at approximately 250 million cubic feet per day. The actual timing of the sale depends on timing of the Alaska Natural Gas Transportation System, as well as reservoir management needs to reinject the gas into the reservoir.

In a more detailed fashion, now, I would like to go through the facilities that are included on the islands and in the project. The satellite drilling islands each will be located about 2 1/2 miles from the main production island. These also will be about two miles off shore.

Each of these islands will include drilling and well operation facilities for up to 80 wells, and the islands will be approximately 750 feet by 1000 feet, and constructed of gravel. The facilities on these two islands will include one or more drilling rigs and drilling support equipment, as well as well manifolding and testing equipment, reserve living quarters and emergency facilities.

The main production island will include, in

addition to the drilling and well operation facilities that I've just mentioned on the two satellite islands, it will also include all the main production processing facilities and support equipment for project development.

The production from each of these three islands will be co-mingled at the main island. At that point the fluids will be separated; the gas will be dehydrated and pressed for purposes of gas lift, or gas sales and gas reinjection. The oil will be dehydrated and readied for sales, and the water will be processed, treated and readied for reinjection for the waterflood system.

In addition to that, the island will also inclu the facilities to process the source water which will be coming from the waterflood island out there that I'll discuss in a moment. The island will also include the power generation equipment for the project. Power will be centrally generated on the island and distributed in a power distribution network via subsea cables to the three outlying satellite islands. The actual measurements of the main island are expected to be approximately 1250 by 1350 feet.

The last and smallest of the islands is the

waterflood island. This will be located about two miles further offshore from the main island. This island will also be gravel constructed; approximately 520 feet in diameter. It will be located in approximately 18 feet of water for the purpose of securing year around source of sea water.

On this island will be a seawater intake system, intake structure and a system to transport the sea water via subsea pipeline to the main production island to the system for waterflooding.

The pipelines for the project will include both inter-island pipelines connecting the islands, as well as the sales pipelines to sales points at Prudhoe Bay.

The pipelines that we're envisioning right now will include produced fluid pipelines; it will carry produced fluids from each of the satellite islands to the main island. Water injection pipelines that will transport treated injection water back to each of the satellite islands for waterflood purposes and injection into select waterflood wells.

It will also include possible fuel lines connecting the three islands with the main island, and there will be a source water line which will be serving to transport the source water from the

satellite or waterflood island to the main island.

The subsea pipelines between the islands will range in size form six inches to 24 inches in diameter, and will vary in length from two to two and a half miles. The kind of material will vary, depending on the service of the particular pipeline.

Externally these pipelines will be coated as necessary to protect them from corrosion. They will be insulated to prevent heat loss, and will be weight coded to insure negative bouyancy.

Internally, where necessary, corrosion control methods will be employed. These methods would include internal coating of the pipeline; use of chemical inhibition or a combination of the two whe necessary.

The subsea pipelines will be buried in subsea trenches. these trenches will be covered over and the purpose of the burial and the cover is to protect the line from the natural forces of strudel scour, ice pounding and ice gouging.

The actual depth and method of covering the pipelines has not yet been determined, and depends upon further geotechnical work to determine just what these natural phenomena are doing in the area.

The pipelines, both the inter-island subsea lines

and the sales lines will be designed, installed and operated for the purpose of, and the philosophy of preventing pipeline leaks.

These leak prevention techniques will include proper material selection of the pipelines; proper installation of the lines and operation of the lines to insure that they are properly maintained and operated. Corrosion control methods would be among the standard procedures used to insure the lines internally.

In addition to the general philosophy of leak prevention, leak detection measures will be taken, including both continuous detection measures, monitoring procedures, as well as periodic leak detection inspection, such as visual inspection and use of internal pipeline inspection pigs.

The continuous methods will include flow and pressure deviation, which will be monitored continuously on all pipelines.

In addition to the leak detection, all the pipelines will be freeze protected where necessary. Freeze protection systems will include insulation of the pipelines and in emergency situations, displacement of the pipelines.

The sales pipelines will incude two 16-inch lines

carrying the oil and gas from the main production area over to sales points at Prudhoe Bay. The final terminating point of these lines will be TAPS Pump Station 1 for the oil, and the future Alaska Gas Conditioning Facility for the sales gas.

Through our conceptual work, two alternative routings were examined, and I'll just briefly describe these now. The first of these we refer to as the SagDelta route. In this case the pipelines are buried in a gravel causeway between the main island and shore. At this point they continue buried in a causeway approach. At this point they come above ground and continue on elevated pipeline supports through the Delta area over to Drill Site 9. At this point they follow existing pipeline corridors; the oil going to TAPS Pump Station 1; the gas going to the AGCF. Along this line from the existing Prudhoe Bay road system and Drill Site 9 to the causeway approach will be a paralleling access road.

The alternative to this that was examined is referred to as the West Dock pipeline route. In this case the pipelines are buried in a subsea trench from the main production island over to the PBU West Dock. At this point they come up on the dock and

continue buried in a gravel shoulder added to the dock, thence above ground on elevated supports down to the AGCF for the gas and TAPS Pump Station 1 for the oil.

At this point in time the companies have evaluated these alternatives and we have made a preference selection for the Sag Delta route, coming through the delta area, on the basis of both economic and operational considerations of the two schemes.

I would like to now discuss the two major camps that will be constructed in the respective projects. This will be a base operation camp and a main construction camp, in our conceptual design. Note that these are located approximately six miles from the main production island in the Delta Uplands. They'll be located adjacent to one another on a gravel pad, approximately 50 acres in size.

The base operations camp will be a permanent facility to house approximately 260 people. It will be located on about a 12 acre portion of this pad. The facilities on the BOC, Base Operations Camp, will include living quarters and administrative quarters for operations personnel; wastewater and sewage handling facilities, and power generation and operation support equipment.

The main construction camp located at the same site, will be a temporary facility, operating throug.. the period of construction. It will be designed to house up to 750 construction personnel, and will include the living quarters for those construction personnel, as well as wastewater and sewage handling facilities, fuel and material supply areas and power generation.

Assuming these camps are indeed constructed together, the facilities will be shared to the extent possible.

In addition to the two main camps there may also be temporary small gravel camps, assuming that an onshore gravel source is selected. These camps wil be operated only during the period of gravel use.

In terms of gravel needs for the project, we are estimating at the present time, approximately 8 million cubic yards of gravel will be required. This will include 4 million yards for the island; approximately 2.5 million for the causeway and causeway approach, and another 1.5 million yards for the on-shore road and the pads for the camps and pipeline pad.

The source for the gravel has not yet been selected; both onshore and offshore sources are being

considered. The transportation and placement methods for the gravel will depend upon what source is eventually selected.

I would like to just briefly go through some of the milestones of the project schedule as we see it today. Looking at the detailed design, we're expected to start in the second quarter of this year. In the middle of 1984 at that point we're looking at a major project commitment, or financial commitment for the project, following receipt of permits.

At this point we order the long lead equipment necessary and mobilize for North Slope construction of support facilities.

In late '84 we would start gravel work in the area for gravel pads and preconstruction work, getting ready for the construction camp and BOC.

The main gravel work on the islands and causeway are expected to begin in the summer of 1985, and continue through '86. The module construction in the Lower 48 is expected to begin about mid 1985.

Drilling will begin as soon as the islands are constructed and available. That's expected to begin in the early part of 1986. A number of wells will be predrilled before production facilities are actually

installed and operational, such that a sufficient number of wells will be available for start-up.

The major sealift for the project is the 1987 Sea Lift, and most of the North Slope construction for facility installation will be occurring after that point in time. Pipeline construction will be starting earlier, around the same time as drilling in early 1986. This feeds into our start-up, which, right now, is projected to be approximately mid 1988.

The last item I'm showing down here is future increment design and construction. The sort of increments that we're seeing, and that I really included in the main body of the description would include such things as waterflood, low pressure separation, artificial lift, and other such items, which are really included in the base case, as I described to you. The only uncertainty at this point would be, whether these facilities are actually needed at start-up, or whether they'll be installed at some later date, say four years after start-up.

Just to briefly summarize, the project entails four gravel islands; a main drilling production island, two satellite drilling islands, a waterflood island, a gravel causeway from the main island to shore, access road, and going over and connecting the

causeway to the existing road system in Prudhoe, pipelines -- inner-island pipelines buried subsea connecting the islands, as well as sales lines carrying oil and gas product from the main island through the delta area to sales points at Prudhoe, and two main camps; a main construction camp and a base of operations camp located in the Delta.

That concludes my presentation.

COLONEL SALING:

Those of you who have technical questions, if you will just hold them until Bob is through, we will keep Dan here so he could answer any questions you have on that presentation. Go ahead, Bob.

MR. McDONALD:

The second topic that I wanted to discuss today briefly is the scoping process, and what it's all about. That's the reason why we're here today. I'm sure you're all aware of the fact that the Council on Environmental Quality Guidelines require agencies to insure that they do get input from the public at the first possible opportunity during the processing of an EIS, and that's what we want to do today, is to identify the significant issues that are associated with the proposed acts, and the alternatives.

The public scoping process, is basically the

first of three steps. The first step is what we're doing here today, and that is to get input from you folks. The second step will be to take that information that we got from this Public Scoping Meeting, along with the other four that the Colonel mentioned, and analyze those issues that were raised during those scoping sessions.

The final product out of the scoping process, then, will be a document which we will call the scoping document. In that scoping document we will show what issues were raised at the various scoping meetings, and how we will treat those issues in the Environmental Impact Statement.

This document will be mailed to all of you who are on the Corps mailing list, along with those of you who have registered today. And the thing we want to continue to reiterate, is that we're here to learn today, we're not here to tell you all we know about the project. We need to get your input so that we can, indeed, identify the issues. And once we open this up, we certainly welcome any statements that you might have now at this session, or any written comments that you might prefer to send to the Corps of Engineers later on.

The last topic that I want to generally discuss

is that of the EIS process. For all of you who are associated or familiar with the EIS process, I am sure this is old hat. Some of those of you who are not familiar with the EIS process, it's good to reacquaint you with the EIS process.

We have basically seven tasks that we will be involved in in the EIS process. The first task, the Public Scoping process, obviously that's what we're in today.

From the Public Scoping process we will identify the significant issues, and how we're going to analyze those significant issues and develop a detailed study plan, which each of the disciplines will prepare on how they're going to handle or address these significant issues.

The third task of baseline data collection is one that we're getting ready to proceed on right now. I'm sure you're all aware of the fact that there have been numerous studies conducted on the North Slope, and in particular, for this particular project area. One of the major assumptions that we have made for this particular study is that there is a lot of baseline data available.

In reviewing the baseline data, if we find that there are data gaps, or if we find that there are

some issues raised that we don't have enough baseli data collected, obviously we will have to go back and collect additional baseline data.

But for the time being we are assuming that there is sufficient baseline data to allow us to go through and start our impact analysis process.

Some of those field studies that haven't been completed are of interest, and I wanted to briefly go over four of those.

The first one is the biological and archeological investigations of the road corridor and pipeline route through the Sag Delta, which was completed in 1981.

The second study is the marine environmental studies near the Sag River Delta in 1981.

The third study is the under ice survey of overwintering fish in the Sag River, in the vicinity of the Sag River, which was conducted during the winter of 1981 and 1982.

And then the last major study was that of the summer environmental studies of 1982. And that final report will be released in the near future.

It is also important to note that we have two subcontractors that are providing us environmental support on this project, and they consist of LGL and

Nortec. They will be providing baseline and environmental support, along with participating in impact analysis.

The task four of impact analysis is the heart, of course, of the Environmental Impact Statement. We will conduct rigorous impact analysis of the proposed action, and of the alternatives, to insure that we do identify the significant impacts.

It is also important to note that during task four of impact analysis, we will also identify any mitigation measures, which would lessen the adverse impacts on the environment, or, also, we will identify any additional alternatives that would also do the same.

The outcome of the first four tasks, of course, is the preparation of the draft Environmental Impact Statement, which we are projecting now would be completed in October.

I want to emphasize that the tentative schedule we have on the bottom of the chart is exactly that, it's a tentative schedule, and the schedule could be compressed, or it could be extended, depending upon the outcome of the scoping process and our review of the baseline data.

Following the preparation of the direct

Environmental Impact Statement, there will be a public review period, along with public hearings on the DEIS, and I will anticipate that the Corps will probably hold public hearings at the same places that the scoping sessions have been held to date. The times and places of public hearings will be announced, obviously, later on.

The last step is the preparation of the final Environmental Impact Statement, and that, basically, is the process whereby we will respond to the review comments which have been raised through the review process and we'll make the appropriate changes in the text of the EIS. Here, again, we're anticipating that EIS to be finalized in the first quarter of 1984.

Before we open it up for questions, I would like to go over some of the issues and concerns that have been identified to date, by the Corps and some of the other agencies involved in this process. And it's important for you to realize that this is not an all encompassing list. This is just a list of issues that we have identified to date, and it's a starting point for you to provide your comments and your input to us.

The first potential concern of water quality and

fish migration effects related to the proposed causeway is certainly a principal issue, on which we will be spending a great deal of time over the next 15 months. It was an issue, obviously, in the waterflood EIS, and it will certainly be an issue in this EIS.

The next one regarding the effects of snow goose nesting and marine habitat within the Sag Delta is also a principal issue, in that this is one of the principal snow goose habitats in the United States, and we will certainly be taking a hard look at this particular area of concern.

The third one is the effects of discharge of drilling mud and cuttings offshore. And this will occur primarily from the three drilling islands.

The fourth issue is the effects of the Stefansson Sound Kelp Community, or commonly referred to as the Boulder Patch, which exists in shallower waters offshore of the Sag Delta. As you know, this is a very important ecological area, so we will be taking a real hard look at the project and how it essentially might impact the boulder patch area.

The next one is the disturbance of the bowhead whale and other marine mammels by human activity associated with the Endicott Development Project.

The next one is the effects of the caribou use and their migration and movement patterns across the Sag Delta. There have been numerous ongoing studies, probably over the last ten years, that had been looking at this, and we will, again, take a look at this in this EIS.

The next one which is, here, again, another concern raised by many people, deals with the risk analysis associated with the ice override threat to artificial islands.

And last, the issue raised is also associated with risk analysis, and that is the potential impact of wellhead blowouts and potential pipeline risks.

Now, these are very obvious things that we're looking at; I'm sure you folks have other things you would like to have us analyze at the same time. And, like I mentioned before, that is the purpose of the scoping process, is to get your input on what you feel is significant.

So with that as a general introduction of the project engineering, and the description of the project, along with the alternatives, and a little bit about the EIS process and scoping process, I'll now turn it over to Colonel Saling.

*

COLONEL SALING:

Let me ask, first of all, to have you address those technical questions which you may have on the scope of the project; any questions you have on the preparation of the EIS. And then I'm going to make a quick check and see how many more people have indicated a desire to make a statement or make some formal comment.

So let me open the floor now for those people who have questions of Dan Huxley, or Bob, or myself, with regard to what's been presented so far.

UNIDENTIFIED SPEAKER:

Gravel source -- where would the gravel come from?

MR. HUXLEY:

We're looking at both onshore and offshore sources. Were we to choose an onshore, we'd likely select one of the currently permitted sources in the Sag Delta area. There are offshore sources which we're also examining at this point in time; we haven't made a selection or a preference on which should we take, from onshore or offshore.

UNIDENTIFIED SPEAKER:

What are the estimated recoverable reserves of the area?

MR. HUXLEY:

The estimated oil-in-place is about 1 billion barrels; estimated gas-in-place is about a trillion cubic feet; obviously, not all that is going to be recovered, but that's about the best we have for in-place estimates.

UNIDENTIFIED SPEAKER:

Are interruptions in the causeways to the main island part of the discussion within the EIS?

COLONEL SALING:

I'll answer that, and the answer is, yes, very definitely. That was one of the issues that was raised during the waterflood, and the whole impact on fish migration parallel to the shore and currents, and so on, obviously are of interest, and so, yes, that will be addressed.

UNIDENTIFIED SPEAKER:

The fact that the designers have selected a preference for a particular design, does that mean that engineering design work does not continue on the alternatives? In other words, two years hence, if a major problem were discovered per the design, would other alternatives have been engineered to the point that that project at that time could be brought on line?

COLONEL SALING:

That's pretty much up to the applicant. One of the purposes of the EIS is to address the alternatives, and if he picks a particular alternative and it turns out that it's not the one which is the most desirable, and the EIS clearly illustrates that, he runs the risk of guessing wrong. So I would have to answer it in the sense that he may feel that he has the answer, as far as which is the best alternative, but it's up to the EIS process to determine what the actual answer is. Hopefully the two would coincide. So we have no way of requiring the applicant to pursue one of the alternatives in the preliminary stages, but once the decision is made on the most desirable solution, then that's the one that has to be pursued, so we just hope he guesses right.

Yes, sir.

UNIDENTIFIED SPEAKER:

Are there any alternatives being considered for the use of gravel?

MR. HUXLEY:

The alternatives I just mentioned. I don't know whether you had some specific other alternative, I mean, onshore and offshore; were you thinking of some

specific site?

UNIDENTIED SPEAKER:

What about the use of artificial sea ice, or artificial fresh water ice structures?

MR. HUXLEY:

We don't see ice as being a feasible alternative for a permanent structure. It's been used for exploration drilling, but that's a very seasonal nature in this area here, that the ice would melt in the summertime and we wouldn't have a structure.

UNIDENTIFIED SPEAKER:

Is the option of a piling supported causeway not under consideration?

COLONEL SALING:

Let me answer that one, also, because their recommended solution, the one that they're proceeding on, does involve a causeway.

One of the key questions, as was pointed out, is the question of a causeway, and when we look at it there are a number of alternatives, and we haven't really talked about all of them. One of them is placing it under sea, such as the other pipelines. One would be to put it on some sort of pilings, however, you recognize, because of the ice problems, that might not be structurally possible.

The reason that the causeway was selected is because, from a structural standpoint, the ice has the least impact on it, and you run the least risk of damaging the pipeline. So that's the one that you've seen here.

There are some other alternative solutions of pilings under water with some combination of bridges and causeway. We're not going to rule out any of them in this stage of the game, but from just looking at it very quickly, the piling does have some distinct structural problems because of the ice.

UNIDENTIFIED SPEAKER:

One of the main rationales of the Prudhoe Bay waterflood to monitoring the causeway was to look at the causeway in an onshore transport. This is now -- another causeway is being constructed upstream from the waterflood causeway. Is there any plans on looking at the vicinity that's involved; putting two causeways out there, or there might be any communication between whatever environmental works and the coordination of this one.....

COLONEL SALING:

I know just offhand, in addition to the -- of course you have the West Dock waterflood causeway; you have this one that's proposed, and I know of two

other causeways right now that are being proposed in addition to that.

The only thing I could tell you is, is that the question of causeways, in general, and their interference with that current and the fish migration is something we're going to address in the environmental impact statement. And it's obviously something, because of the questions that were raised at the time of waterflood, is something that's going to be addressed in significant detail.

That's about as much as I can tell you, other than it is of considerable concern to a lot of people, and our other meetings with people who have expressed the same worry. You put it a little bit better, the synergistic effect of multiple causeways, and we'll note that as something that we ought to take a look at.

MR. McDONALD:

We'll also have to take a look at that particular issue in our cummulative impact analysis, and I think that's what you're looking at.

UNIDENTIFIED SPEAKER:

Well, the thing that bothers me most is Arco's dumping a lot of money into the Prudhoe Bay causeway, with the idea of dumping money into that, therefore

getting information that one could project. But the construction of this particular causeway, may compromise with other data, is collected from the other one, because it will probably cause preservation, I don't know whether minor or major, of sediment discharge, longshore transport across the Sag Delta, which will cause some transport of resuspension of sediments, and perhaps the change in cold and warm water, which is also part of the known effects of the Prudhoe Bay causeway -- the waterflood causeway, which is why I'm curious whether there's going to be any deliberate studies that look at the interaction, such that when one sees the change of the Prudhoe Bay waterflood causeway, you're going to know whether it's due to construction upstream or whether it's due to siltation.....

COLONEL SALING:

At this stage in the process I can only say that you've raised an issue that we're going to have to address one way or the other. I understand what you're saying, you're introducing additional variables, which you may not be able to eliminate through some assumption. Your point is well taken, and at this stage of the game I can only say that that's a good input.

And, as I say, it's not only the variables introduced by that one, but at least two more that I know of that are being proposed that haven't even come up for public review yet.

Additional questions?

UNIDENTIFIED SPEAKER:

One further question on the process. we're in the Task 1 right now, the Public Scoping Process. Will there be a agency scoping process? In other words, a workingtype relationship with reviewing agencies, apart from these public meetings?

COLONEL SALING:

The intent of the first five meetings was to get the public comment before we went to the agencies their scoping.

UNIDENTIFIED SPEAKER:

So a question concerning, say, the assumption that the existing baseline data is adequate would be subject to discussion at those kinds of meetings.

COLONEL SALING:

Yes, I would think so.

MR. McDONALD:

Do you remember I mentioned the work study plans that we would follow in Task 2. Our plan would be to work through the Corps to identify the agencies that

should have an opportunity to review those study plans, and in doing that that would give you a good opportunity to either confirm or deny the assumption that the baseline data is adequate. I know Rich has some plans for subsequent coordination with the agencies.

COLONEL SALING:

Excuse me. Before I get any further, let me identify a couple people that I brought with me.

Rich Gutleber is from my office, and he is the Study Manager for the Corps. And if you need to get in contact with somebody at my office with regards to the Endicott Development EIS, he's the guy.

Sitting in the back of the room with his hand now in the air is Dave Barrows. Dave is my Branch Chief and the head of my regulatory functions branch, and he's the guy who processes permits. And, of course, this being a permit action, he has a very definite interest.

So those are the two people in my office that are keyed to this particular operation, and you may want to chat with them a little bit informally after we complete the formal part of this meeting.

Any other questions now on the technical aspect?

(No audible response.)

Dave Norton had indicated that he would like to speak.

And what I would like to do, Dave, if you would come up to the podium and make your comments. I'm not going to take a break as I intended. Then I would like to leave the meeting open to have any questions, comments from the floor, because, really, what I want to do is to get your comments, not to have you come up and practice your public speaking style.

Dave, would you mind coming up and giving us your comments.

(Wherupon a brief off the record period was then taken to change the tape.)

MR. NORTON:

I'm Dave Norton. My interest is in science and publication of scientific results of environmental studies in Alaska.

I would like to separate my comments very clearly between what I think are environmental considerations for the EIS and subsequent value to procedures for this project, and second, to the sort of scientific context of the Endicott Project.

In just picking off against the slides which were shown a few moments ago about previously raised

scoping issues, it seems to me that some of the things that I just scratched down hurriedly yesterday seemed to be pretty well covered. But let me itemize one or two things that I didn't see mentioned on that slide that I would like to see emphasized in the environmental impact assessment process.

First, I didn't see mention of the river runoff process in the spring, and very specifically, in either the engineering document or environmental concerns as a physical constraint and a design consideration.

It seems to me that we have looked at enough of the river runoff, and this, of course, is right off the mouth of the Sag. That may be either a greater or lesser concern than is presently indicated. I think that that probably is an item that needs to be addressed for peoples' reassurance.

The next items of interest for EIS. There are several here that relate to fisheries and anadramous fish. I think the biggest one, really, is to call upon Don Shell's comment, is the interactive, or synergistic effects of the various coastal modifications, including the other three or four causeway areas. It's no small task, as I discovered a couple weeks ago to consider cumulative impacts.

We went through an exercise of looking at several interactive types of development impacts on the North Slope, and I felt pretty well overwhelmed for awhile by the problem easing out of the individual and the multiple impacts, but it seems to me that that is well worth doing.

I assume that at some point in an environmental assessment process, the issue of entrainment and impingement losses or effects on biota, including anadromous fish, will come up in relation to the overall Endicott Project. Perhaps that's much farther down the line, inasmuch as I guess that this waterflood will be years in the future.

One final on fisheries, is to point out that th question of gravel removal if some of the lower Sag Delta sites are chosen as on-land sites. There needs to be an indication in the scoping document that indeed there were under-ice surveys for all the wintering fish, and I think that therefore, this will probably be adequately considered or addressed in the EIS as it should be.

In relation to non-fisheries things, the snow goose consideration was mentioned; I won't waste time on that.

Recently, however, in relation to other or biota

we can continue to perceive that coastal develoments, particularly causeways, where you may set up on one side or the other, relatively calm water. There are several species of important North Slope birds, particularly in the post breeding season, noteably phalar, oldsquaw and eiders, which rely on nearshore shallow areas to quite an extent. They will select the quieter bodies of water divided by an artificial structure for molting, feeding and other activities.

Unfortunately, this may expose them to increased risk contact with accidentally spilled pollutants, whether refined or crude toxicants, and I think that that is a kind of risk that needs to be identified, both singly and in a cummulative sense.

Are there any questions on that part of what I had to say?

COLONEL SALING:

No, that's good. That's the kind of input we're looking for.

MR. NORTON:

The second half of what I wanted to say is somewhat more philosophical and not restricted to the EIS.

I think it's important in the EIS and the working

arrangements for the applicants and the Corps and t' consultants have -- it's important to keep in mind that this is the N plus fifth individual development in a number of petroleum related developments, including Prudhoe Bay, the joint offshore lease sale of 1979, the sale in '71, etc., etc., and speaking from a scientific point of view, I think what needs to be brought out is that we are getting smart.

The things that the scientific community were worried about in 1977, '78 and '79, are partially now much less of a concern as far as environment impact, because, in part, to the West Dock Waterflood, there was a monitoring or technical evaluation program that I think has given us important new scientific information, so that, perhaps now the things we're worried about are different from, and evenly hopefully lesser than what things gave the scientific community concern several years ago.

In this sort of suite of developments, which I hope can be evaluated in a cummulative sense, I think it's important for somebody from the scientific community to say, let's keep up the evaluated studies, because there are going to be further generations. There are going to be more causeways to the west if oil is found.

Sohio, Exxon, Arco, and the Corps, I hope will continue to pay more than one shot attention to questions of anadromous fish, or accommodation by snow geese, because the later projects, we hope, again, to be still smarter and worried about the important things, rather than what turn out to be the small ones. So I hope that there will be a continuing evaluation of what we know and where we stand.

As I mentioned that I'm involved in publishing, recently a publication that I work for has accepted three papers dealing with Artic Cisco. That work was begun essentially by the Outer Continental Shelf Environmental Assessment Program.

Part of it was picked up by the Corps of Engineers and Arco on the waterflood, and I believe some of it is continuing as part of this project.

These publications are now going into the scientific literature. They bring as much credit to the funding companies and cooperating agencies as they do to the scientists themselves.

We have a body of growing understanding environmental assessment in northern Alaska that I think can reflect credit on the people who will keep up their interest in these matters.

COLONEL SALING:

Thank you very much.

UNIDENTIFIED SPEAKER:

I asked about ice islands a little while ago, and ice structures. This amount of gravel, this 10 million yards of gravel is only (indiscernible - away from microphone) up there. There's going to be more development up there, more islands, more gravel and more gravel.

And this is an area in which the water is relatively shallow, and could be experimented with in this area, and could probably be used. I'm not absolutely certain, but there's certainly very little experimentations going on up there.

Unless pressed to the wall to perform these experiments, (indiscernible) in relatively shallow water, we're going to see more and more gravel moving in to islands to causeways and so on.

Ice is cheap; it doesn't cost very much; gravel is very expensive. It adds to the wellhead cost of oil and gas produced up there, which I was opposed to. But I think it's extremely important that ice islands and ice causeways be considered here and be considered early on (indiscernible) two, three, four years.

COLONEL SALING:

What you're saying is, is that there may be a year-round utility and not to sort of dismiss them out of hand.

UNIDENTIFIED SPEAKER:

Sure. Of course. It's easy if you're (indiscernible) these things, so say, "Well, let's do it with gravel; this is the way we've always done it, or we'll do it this time and so on. Gravel is disappearing, and I know the oil companies have fought this, but it is a disappearing resource, and it seems to me be economic advantage to possibly use ice.

COLONEL SALING:

Thank you.

Additional questions and comments?

(No audible response.)

Well, ladies and gentlemen, if you have no further comments, I would indicate that we would like to have you provide us, as you reflect on the scoping documents that we've handed out today, and as you think a little bit about this, if you have an idea that you would like to pass to us, something that you think needs to be addressed as part of this process, please send it to our office in Anchorage, attention

to Mr. Gutleber, and I think our address is in that scoping document. So if you have one of those you know where to send it.

I appreciate your coming today, and if you have any formal comments, which are just as valid as the ones that you make in front of the microphone, get hold of Rich or one of us after the meeting and bend our ear. Thank you very much.

(Whereupon the hearing adjourned at 2:14 p.m.)